



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/590,227	05/14/2007	Carlo Baldovino	930063-2031	6956

20999 7590 07/20/2011
FROMMER LAWRENCE & HAUG
745 FIFTH AVENUE- 10TH FL.
NEW YORK, NY 10151

EXAMINER

MOMPER, ANNA M

ART UNIT	PAPER NUMBER
----------	--------------

3657

MAIL DATE	DELIVERY MODE
-----------	---------------

07/20/2011

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/590,227	Applicant(s) BALDOVINO ET AL.
	Examiner ANNA MOMPER	Art Unit 3657

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 June 2011.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-7,11-31,35-51,53-82 and 86-98 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-7,11-31,35-51,53-82 and 86-98 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| <p>1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)</p> <p>2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)</p> <p>3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.</p> | <p>4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.</p> <p>5) <input type="checkbox"/> Notice of Informal Patent Application</p> <p>6) <input type="checkbox"/> Other: _____.</p> |
|--|--|

DETAILED ACTION

Response to Amendment

1. Amendment to the claims received 6/6/2011 has been entered. Claims 1, 25, 51, 72, 75, 75 have been amended. Claim 99 has been canceled.
2. Applicant has noted claims as "withdrawn" in the application. If applicant intends to no longer have these claims examined, applicant should "cancel" the claims, as "withdrawn" is used with respect to Restriction Requirements and Election of Species Requirements.
3. The declaration under 37 CFR 1.132 filed 6/6/2011 is insufficient to overcome the rejection the claims based upon Cicognani et al. in view of Akiyama et al. (newly recited below as set forth in the last Office action because: Upon further searching and consideration of the claims Akiyama et al. (US 7382274) which is not applicable as prior art, however has a foreign filing date of 4/9/2003 and a earliest publishing date of 10-21-04 (less than one month after the filing of the instant application), which establishes the knowledge and skill of one of ordinary skill in the art at the time of the invention and discloses a reinforcing fiber for use in rubber articles such as a belt (Fig. 3) having a carbon fiber core (11) and a plurality of glass fibers (12) wound around such as to completely cover and surround the carbon fiber core. Akiyama et al. further discloses the cord as presenting excellent strength, dimensional stability and bending fatigue resistance as well as disclosing that the combination allows for better adhesion to rubber as glass exhibits better adhesion than carbon to rubber. Therefore, as it is known that glass exhibits better adhesion to the rubber, the results of the claimed invention would not have been unexpected results.

Response to Arguments

Art Unit: 3657

4. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 26 and 53 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. Claims 26 and 53 recite “said first material covers said second material at least partially”. This is indefinite as the parent claim has been amended to recite the first material covers the second material “entirely”. Thereby introducing a limitation broader than previously cited.

8. The following is a quotation of the fourth paragraph of 35 U.S.C. 112:

Subject to the [fifth paragraph of 35 U.S.C. 112], a claim in dependent form shall contain a reference to a claim previously set forth and then specify a further limitation of the subject matter claimed. A claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers.

9. Claims 3, 37, and 78 recite “said first material entirely surrounds said second material”, which has been previously recited in the parent claim thereby introducing no new limitations into the claim.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are

Art Unit: 3657

such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

1. Claim 1, 3-4, 25-28, 51,53-54, 71-76 and 78-79 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cicognani et al. (US 4,099,422) in view of Akiyama et al. (US 2004/0226641 A1).

As per claims 1 and 3, Cicognani et al. discloses a toothed belt (Fig) for use with oil (Col. 1, Ln. 29-40, Col. 2, Ln. 55-61), the belt comprising:

a body (1),

a plurality of teeth (3, Col. 2, Ln. 3-5) extending from a first surface of said body (Fig.), said teeth being coated by a first fabric (6), and

a plurality of resistant inserts (2) made from flexible and inextensible materials such as fiberglass, steel and the like (Col. 2, Ln. 1-2);

wherein said toothed belt is adapted to operate in substantially continuous contact with or partially immersed in oil (Col. 1, Ln. 29-40, Col. 2, Ln. 55-61).

Cicognani et al. fails to explicitly disclose the resistant inserts comprise fibers produced from at least a first and second material, the first material being glass fibers and the second material being carbon fibers and the first material entirely covering the second material.

Art Unit: 3657

Akiyama et al. discloses a rubber reinforcing cord, to embed into rubber products such as rubber belts ([0001]), said reinforcing cord (1) comprising core (2) which may be twisted ([0033], [0034]) and a plurality of secondary strand (3) having a primary twist as well as the secondary strands and the core being twisted together (Fig. 2, [0037]) and the core is made from PBO and the secondary strands are made from glass fibers in an example ([0034]) however fiber strands of two or more kinds can be used having two different elastic moduli, including PBO, carbon fiber, glass fiber and aramid fiber, and wherein the higher-modulus fiber is disposed in the center and a plurality of lower-modulus strands are disposed around the higher-modulus fiber strand.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt of Cicognani et al. to include a first set of twisted yarns wound around a second set of twisted yarns such that the first set completely covers the second set, and the material of the yarns comprise glass and carbon fibers, as taught by Akiyama et al. for the purpose of improving flexural fatigue resistance

Akiyama et al. discloses that carbon fiber and glass fiber could be selected as appropriate materials for each the fibrous core and the subsidiary strands, however fails to explicitly disclose a combination of carbon fiber being used in the fibrous core while glass fibers used in the subsidiary strands, however it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the cords of Akiyama et al. to include the glass fibers being the subsidiary strands and the carbon fibers being the core fibers as Akiyama et al. discloses a finite number of possible combinations of materials and it would have been obvious to select one of the finite combinations with predictable results.

Art Unit: 3657

Akiyama et al. discloses carbon fiber having an elastic modulus from 210-380 GPa and glass fiber having an elastic modulus from 60-80 GPa ([0023], [0029]), however fails to disclose a modulus in the form of N/mm (equivalent to spring constant) of either the glass and carbon fibers or the composite modulus of the overall inserts. Applicant discloses that the prior art inserts made of glass fiber have at most a modulus of 28 N/mm, and it is well known that carbon fiber has a higher modulus than glass fiber and the exact value is dependent on the percentage of glass and carbon fibers in the resulting structure. Akiyama et al. discloses 10%-40% of the cross-sectional area comprising the higher-modulus carbon fiber, and the rest being the lower modulus glass fiber, therefore the resulting insert would have a value greater than that of the glass fiber but less than that of the carbon fiber, therefore resulting in a modulus greater than 28 N/mm.

As per claims 25-27, Cicognani et al. discloses a timing control system for a motor vehicle (Col. 1, Ln. 4-5, Ln. 29-40) comprising at least one driving pulley, one driven pulley and a toothed belt (Col. 2, Ln. 54-58) adapted for use in substantially continuous contact with oil or partially immersed in oil, and materials for maintaining said toothed belt in an oil wet condition (Col. 2, Ln. 55-61, Col. 3, Ln. 12-20);

said belt comprising a body (1), and

one or more teeth (3, Col. 2, Ln. 3-5) extending from a first surface of said body (Fig.), said teeth being coated by a first fabric (6), and

a plurality of resistant inserts (2) made from flexible and inextensible materials such as fiberglass, steel and the like (Col. 2, Ln. 1-2);

Art Unit: 3657

Cicognani et al. fails to explicitly disclose the resistant inserts comprise fibers produced from at least a first and second material, the first material being glass fibers and the second material being carbon fibers and the first material entirely covering the second material.

Akiyama et al. discloses a rubber reinforcing cord, to embed into rubber products such as rubber belts ([0001]), said reinforcing cord (1) comprising core (2) which may be twisted ([0033], [0034]) and a plurality of secondary strand (3) having a primary twist as well as the secondary strands and the core being twisted together (Fig. 2, [0037]) and the core is made from PBO and the secondary strands are made from glass fibers in an example ([0034]) however fiber strands of two or more kinds can be used having two different elastic moduli, including PBO, carbon fiber, glass fiber and aramid fiber, and wherein the higher-modulus fiber is disposed in the center and a plurality of lower-modulus strands are disposed around the higher-modulus fiber strand.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt of Cicognani et al. to include a first set of twisted yarns wound around a second set of twisted yarns such that the first set completely covers the second set, and the material of the yarns comprise glass and carbon fibers, as taught by Akiyama et al. for the purpose of improving flexural fatigue resistance

Akiyama et al. discloses that carbon fiber and glass fiber could be selected as appropriate materials for each the fibrous core and the subsidiary strands, however fails to explicitly disclose a combination of carbon fiber being used in the fibrous core while glass fibers used in the subsidiary strands, however it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the cords of Akiyama et al. to include the glass fibers being the

Art Unit: 3657

subsidiary strands and the carbon fibers being the core fibers as Akiyama et al. discloses a finite number of possible combinations of materials and it would have been obvious to select one of the finite combinations with predictable results.

As per claims 51 and 53, Cicognani et al. discloses a toothed belt (Fig) adapted for use in substantially continuous contact with oil or partially immersed in oil (Col. 1, Ln. 29-40, Col. 2, Ln. 55-61), the belt comprising:

a body (1),

a plurality of teeth (3, Col. 2, Ln. 3-5) extending from a first surface of said body (Fig.), said teeth being coated by a first fabric (6), and

a plurality of resistant inserts (2) made from flexible and inextensible materials such as fiberglass, steel and the like (Col. 2, Ln. 1-2);

wherein said toothed belt is adapted to operate in substantially continuous contact with or partially immersed in oil (Col. 1, Ln. 29-40, Col. 2, Ln. 55-61).

Cicognani et al. fails to explicitly disclose the resistant inserts comprise fibers produced from at least a first and second material, the first material being glass fibers and the second material being carbon fibers and the first material entirely covering the second material.

Akiyama et al. discloses a rubber reinforcing cord, to embed into rubber products such as rubber belts ([0001]), said reinforcing cord (1) comprising core (2) which may be twisted ([0033], [0034]) and a plurality of secondary strand (3) having a primary twist as well as the secondary strands and the core being twisted together (Fig. 2, [0037]) and the core is made from PBO and the secondary strands are made from glass fibers in an example ([0034]) however fiber strands of two or more kinds can be used having two different elastic moduli, including PBO,

Art Unit: 3657

carbon fiber, glass fiber and aramid fiber, and wherein the higher-modulus fiber is disposed in the center and a plurality of lower-modulus strands are disposed around the higher-modulus fiber strand.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt of Cicognani et al. to include a first set of twisted yarns wound around a second set of twisted yarns such that the first set completely covers the second set, and the material of the yarns comprise glass and carbon fibers, as taught by Akiyama et al. for the purpose of improving flexural fatigue resistance

Akiyama et al. discloses that carbon fiber and glass fiber could be selected as appropriate materials for each the fibrous core and the subsidiary strands, however fails to explicitly disclose a combination of carbon fiber being used in the fibrous core while glass fibers used in the subsidiary strands, however it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the cords of Akiyama et al. to include the glass fibers being the subsidiary strands and the carbon fibers being the core fibers as Akiyama et al. discloses a finite number of possible combinations of materials and it would have been obvious to select one of the finite combinations with predictable results.

As per claims 72 and 78, Cicognani et al. discloses a method for providing a belt for use with oil comprising:

providing an oil-wet environment (Col. 2, Ln. 59-61),

providing a toothed belt to operate in said oil-wet environment (Col. 2, Ln. 55-61), said belt comprising:

a body (1),

Art Unit: 3657

a plurality of teeth (3, Col. 2, Ln. 3-5) extending from a first surface of said body (Fig.), said teeth being coated by a first fabric (6), and

a plurality of resistant inserts (2) made from flexible and inextensible materials such as fiberglass, steel and the like (Col. 2, Ln. 1-2);

wherein said toothed belt is adapted to operate in substantially continuous contact with or partially immersed in oil (Col. 1, Ln. 29-40, Col. 2, Ln. 55-61).

Cicognani et al. fails to explicitly disclose the resistant inserts comprise fibers produced from at least a first and second material, the first material being glass fibers and the second material being carbon fibers and the first material entirely covering the second material.

Akiyama et al. discloses a rubber reinforcing cord, to embed into rubber products such as rubber belts ([0001]), said reinforcing cord (1) comprising core (2) which may be twisted ([0033], [0034]) and a plurality of secondary strand (3) having a primary twist as well as the secondary strands and the core being twisted together (Fig. 2, [0037]) and the core is made from PBO and the secondary strands are made from glass fibers in an example ([0034]) however fiber strands of two or more kinds can be used having two different elastic moduli, including PBO, carbon fiber, glass fiber and aramid fiber, and wherein the higher-modulus fiber is disposed in the center and a plurality of lower-modulus strands are disposed around the higher-modulus fiber strand.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt of Cicognani et al. to include a first set of twisted yarns wound around a second set of twisted yarns such that the first set completely covers the second set, and the

Art Unit: 3657

material of the yarns comprise glass and carbon fibers, as taught by Akiyama et al. for the purpose of improving flexural fatigue resistance

Akiyama et al. discloses that carbon fiber and glass fiber could be selected as appropriate materials for each the fibrous core and the subsidiary strands, however fails to explicitly disclose a combination of carbon fiber being used in the fibrous core while glass fibers used in the subsidiary strands, however it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the cords of Akiyama et al. to include the glass fibers being the subsidiary strands and the carbon fibers being the core fibers as Akiyama et al. discloses a finite number of possible combinations of materials and it would have been obvious to select one of the finite combinations with predictable results.

As per claim 4, 28, 54 and 79, Akiyama et al. discloses the first material has a lower modulus with respect to the second material ([0022]).

As per claim 71, Cicognani et al. discloses the toothed belt is configured to replace a chain in a timing control system without any dimensional variations being made to the timing control system (Col. 1, Ln. 34-40).

As per claims 73 and 75, Cicognani et al. discloses the belt coming in contact with the belt, and a pump for use in circulating the oil, however fails to explicitly disclose the use of an oil spray or the application of such being at a rate of approximately 5.8 gallons/hr. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Cicognani et al. to include an oil spray and to apply said oil spray at a rate of approximately 5.8, as the use of such is a design choice of which one of ordinary skill in the art at the time of the invention would be capable of based on the system requirements.

Art Unit: 3657

As per claim 74, Cicognani et al. further discloses the oil-wet environment comprises an oil bath (Col. 2, Ln. 59-61).

As per claim 76, Cicognani et al. further discloses the oil being at 140°C which converts to 284° F (Col. 3, Ln. 1-5).

2. Claim 46 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cicognani et al. (US 4,099,422) in view of Akiyama et al. (US 2004/0226641 A1) and further in view of Danhauer et al.

Modified Cicognani et al. fails to explicitly disclose the use of discrete fibers in the elastic material

Danhauer et al. a belt (10) having a body (12, 14, 16) having a plurality of inserts (22) and the body comprising discrete fibers in the elastomeric material ([0026]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt of Modified Cicognani et al., to include discrete fibers in the elastic material, as taught by Danhauer et al., for the purpose of reinforcing the belt.

3. Claims 22 and 69 and 97 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cicognani et al. (US 4,099,422) in view of Akiyama et al. (US 2004/0226641 A1) and Osako et al. (US 7,056,249 B1) and further in view of Danhauer et al.

Modified Cicognani et al. fails to explicitly disclose the use of discrete fibers in the elastic material

Danhauer et al. a belt (10) having a body (12, 14, 16) having a plurality of inserts (22) and the body comprising discrete fibers in the elastomeric material ([0026]).

Art Unit: 3657

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt of Modified Cicognani et al., to include discrete fibers in the elastic material, as taught by Danhauer et al., for the purpose of reinforcing the belt.

4. Claim 5-7, 29-31, 55-57 and 80-82 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cicognani et al. (US 4,099,422) in view of Akiyama et al. (US 2004/0226641 A1) and further in view of Mashimo et al. (US 4,498,891).

Modified Cicognani et al. fails to explicitly disclose the second material occupies a surface between 15 and 75% (claims 5, 29, 55, 80) or preferably between 35 and 45 % (claims 6, 30, 56, 81) of the total surface of the body, and the resistant inserts have two twists in the same direction (claims 7, 31, 82, 57).

Mashimo et al. discloses a belt (Fig. 1, Fig. 2) having resistant inserts (16) being woven in the type of Lang's twist (Col. 2, Ln. 60-64) and occupying a surface between 35 and 45% of the total (Table 1).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt of Modified Cicognani al. to include the second material occupies a surface of between 15 and 75% and between 35 and 45 % of the total surface of the body, and the resistant inserts have two twists in the same direction, as taught by Mashimo et al., for the purpose of providing stiffness to the belt.

5. Claims 11-12, 35-36, 58-59, and 86-87 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cicognani et al. (US 4,099,422) in view of Akiyama et al. (US 2004/0226641 A1) and further in view of Knutson (US 6,945,891).

Art Unit: 3657

Akiyama et al. discloses the resistant inserts being treated with an RFL solution comprising a latex ([0027], [0032]). However, Modified Cicognani fails to disclose the latex selected to resist oils (claim 11, 35, 58, 86) which comprises an elastomeric material formed from a copolymer obtained from a diene monomer and a monomer containing nitrile groups (claim 12, 36, 59, 87).

Knutson discloses a power transmission belt (10) in which tensile fibers (18) of carbon are coated with an RFL composition (Col. 6, Ln. 8-23) wherein the RFL composition comprises a latex which comprises the copolymer HNBR (Col. 6, Ln. 45-60).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt of Modified Cicognani et al. to include the resistant inserts have been treated with an RFL comprising a latex which comprises an elastomeric material formed from a copolymer obtained from a diene monomer and a monomer containing nitrile groups, as taught by Knutson, for the purpose of ensuring adhesion of the resistant inserts to the belt.

6. Claims 13-14, 37-38, 60-61 and 88-89 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cicognani et al. (US 4,099,422) in view of Akiyama et al. (US 2004/0226641 A1) and Knutson (US 6,945,891), as applied to claim 12 above, and further in view of Acten (US 7,396,884 B2).

Modified Cicognani et al. fails to explicitly disclose the nitrile groups are in a percentage between 33 and 49 weight % of the final copolymer (claim 13, 37, 60, 88) or preferably 39 weight % (claims 14, 38, 61, 89).

Art Unit: 3657

Acten discloses an adhesive base for reinforcing materials (Col. 1, Ln. 16-20) containing HNBR wherein the nitrile group content is in the range of 10 to 50 wt. % or preferably 15 to 39 wt. %.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt of Modified Cicognani et al. to include the nitrile groups are in a percentage between 33 and 49 weight % of the final copolymer, or preferably 39 weight %, as taught by Acten, for the purpose of ensuring adhesion of the resistant inserts to the belt.

7. Claims 15-21, 22, 39-45, 50, 62-68, and 90-96 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cicognani et al. (US 4,099,422) in view of Akiyama et al. (US 2004/0226641 A1) and further in view of Osako et al. (US 7,056,249 B1).

As per claims 15, 17-18, 39, 41-42, 50, 62, 64-65, 90, and 92-93 Cicognani et al. further discloses the fabric is externally coated by a resistant layer wherein the resistant layer comprises an oil resistant elastomer (Col. 2, Ln. 6-10). Modified Cicognani et al. fails to explicitly disclose the resistant layer comprises a fluorinated elastomer, specifically polytetrafluoroethylene (claims 18, 42, 65, 93) in an amount between 101 and 150 parts per weight with the elastomeric material (claims 17, 41, 50, 64, 92), and a vulcanizing agent.

Osako et al. discloses a belt (10) having a fabric layer (24, 56) coated by a resistance layer (40) of polytetrafluoroethylene (Col. 6, Ln. 26-32) in an amount of 30 to 200 parts per weight of a first elastomeric material (36, Col. 6, Ln. 7-12, Ln. 43-46).

Osako et al. fails to explicitly disclose the use of a vulcanizing agent, however Osako et al. discloses the step of vulcanizing after the treatment of the fabric (Col. 8, Ln. 44-50), however

Art Unit: 3657

it would have been known by one in the art that a vulcanizing agent could be used to speed up vulcanization.

It would have been obvious to one of ordinary skill in the art at the time of the time of the invention to modify the belt of Modified Cicognani et al. to include a resistant layer of polytetrafluoroethylene in an amount between 101 and 150 parts per weight of a first elastomeric material and a vulcanizing agent for the purpose of reducing friction.

As per claims 16, 40, 63, and 91 Cicognani et al. discloses the belt body being made of an oil resistant elastomeric composition but fails to explicitly disclose the body comprises a mixture based on a second elastomeric material formed from a copolymer obtained from a diene monomer and a monomer containing nitrile groups.

Osako et al. further discloses the body (12) comprises a mixture based on a second elastomeric material formed from a copolymer obtained from a diene monomer and a monomer containing nitrile groups (Col. 8, Ln. 20-31, NBR- nitrile butadiene rubber).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt of Modified Cicognani et al. to further include the body comprises a mixture based on a second elastomeric material formed from a copolymer obtained from a diene monomer and a monomer containing nitrile groups, as taught by Osako et al., for the purpose of selecting an appropriate material and properties for a chosen application of the belt as well as selecting a material having good heat and oil resistance.

As per claim 19-21, 43-45, 66-68, and 94-96, Osako et al. further discloses that for use in a toothed belt, the cloth layer can be provided on the back surface as well (Col. 4, Ln. 36-39) and the cloth layer for the back surface having the same configuration as that on the toothed surface.

Art Unit: 3657

8. Claims 23, 47 and 98 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cicognani et al. (US 4,099,422) in view of Akiyama et al. (US 2004/0226641 A1) and Osaka et al. (US 7,056,249 B1) and further in view of Knutson (US 6,945,891).

Modified Cicognani et al. fails to explicitly disclose the fibers are present in an amount in weight between 0.5 and 15% with respect to said elastomeric material.

Knutson et al. discloses a power transmission belt (10) having of discrete fibers in the elastomeric material (Col. 4, Ln. 7-25) in the range of about 0.5 to 20 phr with respect to the elastomeric material (Col. 4, Ln. 7-25).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt of Modified Cicognani et al. to include the fibers are present in an amount in weight between 0.5 and 15% with respect to said elastomeric material, as taught by Knutson et al., for the purpose of increasing strength of the belt.

9. Claims 24, 48, and 70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cicognani et al. (US 4,099,422) in view of Akiyama et al. (US 2004/0226641 A1) and further in view of Nakajima et al. (US 5,306,213).

Modified Cicognani et al. fails to explicitly disclose the belt being treated with a polymer resistant to swelling between the toothing and the back side.

Nakajima et al. discloses a toothed belt (30) in which a rubber layer (14) being made of an oil-resistant rubber composition different from that of the belt body (12) in order to prevent swelling of the belt.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt of Modified Cicognani et al. to include the belt treated with a polymer

Art Unit: 3657

resistant to swelling, as taught by Nakajima et al., for the purpose of increasing the life of the belt.

10. Claim 49 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cicognani et al. (US 4,099,422) in view of Akiyama et al. (US 2004/0226641 A1) and Nakajima et al. (US 5,306,213), and further in view of Hashimoto et al. (US 2004/0127316 A1).

Modified Welk et al. discloses all elements of the claimed invention as applied to claim 25 above, but fail to explicitly disclose a pad tensioner or a pad.

Hashimoto et al. discloses a pad tensioner (100, TL) and a pad (TG) for use in imparting tension on a timing belt of a power transmission system in a vehicle ([0001], [0008]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt power transmission system of Modified Welk et al. to include a pad or pad tensioner, as taught by Hashimoto et al., for the purpose of maintaining tension in the belt.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANNA MOMPER whose telephone number is (571)270-5788. The examiner can normally be reached on M-F 8-5, first Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Siconolfi can be reached on 571-272-7124. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 3657

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

am

/Robert A. Siconolfi/
Supervisory Patent Examiner, Art Unit
3657